

REMARKS

Claims 1-4 and 9-14 currently appear in this application. The Office Action of June 28, 2002, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicants respectfully request favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Egli et al.

This rejection is respectfully traversed. Egli et al. merely note that hydrogen-oxidizing, autotrophic, nitrate-reducing bacteria were obtained from a commercial groundwater-treatment plant. All that Egli et al. disclose is that groundwater can be treated with hydrogen-oxidizing, autotrophic, nitrate-reducing bacteria, and that these bacteria can be used to dehalogenate highly halogenated hydrocarbons. Egli et al. fail to describe what is claimed herein, namely, treating nitrate-contaminated water in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing, nitrate-reducing bacteria.

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admission

as to the contents of a prior art publication, namely,
Liessens et al.

This rejection is respectfully traversed.
There is nothing in Liessens et al. that teaches or
suggests treating nitrate-contaminated water in a
hydrogen-fed bioreactor with autotrophic, hydrogen-
oxidizing denitrifying bacteria.

Claim 2 is rejected under 35 U.S.C. 102(e) as
being anticipated by Tanaka, the Examiner stating that
the bacteria in Tanaka appear to be hydrogen-oxidizing
denitrifying bacteria.

This rejection is respectfully traversed.
While removing compost from treated contaminated water
effects the physical removal of nitrates within the
compost from the contaminated water, there is nothing in
Tanaka that teaches or suggests removing nitrate from
nitrate-contaminated water by treating the water in a
hydrogen-fed bioreactor with autotrophic, hydrogen-
oxidizing denitrifying bacterial. In fact, Tanaka adds
nitrate ions to the sludge which is reduced to nitrogen
gas to cause the sludge to float.

Claims 3 and 9-13 are rejected under 35 U.S.C.
102(b) as being anticipated by Egli.

This rejection is respectfully traversed.
Claims 3 and 9-13 all depend from claim 1. Claim 1

requires that the process be conducted in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing denitrifying bacteria. There is noting in Egli et al. which discloses or suggests that the ground-water treatment plant included a hydrogen-fed bioreactor as required in the present invention.

Claims 3 and 9-13 are rejected under 35 U.S.C. 103(a) as being obvious over applicant's admissions as to the state of the prior art.

This rejection is respectfully traversed.

Assuming that the admission as to the state of the prior art was with respect to Liessens et al., it should be noted that there is nothing in Liessens et al. that teaches or suggests treating nitrate-contaminated water in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing denitrifying bacteria. Moreover, there is nothing in Liessens et al. that teaches or suggests the combination of the limitations of claim 1, namely, treating nitrate-contaminated water in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing bacteria, with the limitations in claims 9-14, namely:

- a. that the bacteria use nitrate as a respiratory terminal electron acceptor to convert nitrate to nitrogen gas (claim 9);
- b. that the bacteria are *Proteobacteria*

(claim 10);

c. that hydrogen gas is generated by
corrosive oxidation of iron, biological fermentation, or
electrolysis (claim 11);

d. that the bacteria are supported on a solid
surface to support biofilm formation by the bacteria
(claim 12);

e. that the water is percolated through a
sand filtration unit after bacterial treatment (claim
13); and

f. that the water treated is drinking water
(claim 14).

Claims 3 and 9-13 are rejected under 35
U.S.C. 102(e) as being anticipated by Tanaka.

This rejection is respectfully traversed.

While removing compost from treated contaminated water
effects the physical removal of nitrates within the
compost from the contaminated water, there is nothing in
Tanaka that teaches or suggests removing nitrate from
nitrate-contaminated water by treating the water in a
hydrogen-fed bioreactor with autotrophic, hydrogen-
oxidizing denitrifying bacterial. In fact, Tanaka adds
nitrate ions to the sludge which is reduced to nitrogen
gas to cause the sludge to float, whereas the present

invention treats water which is originally contaminated with nitrate ion to remove the nitrate ion.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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